Demonstration of Single Boundary Measurement Techniques Applied to Partially Cold Worked Large Grain Niobium Sheet

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Experiment

Measurements on Partially Cold-Worked As-Received: Large Grain Nb Ingot Slice Courtesy of Peter Kneisel at Jefferson Lab: JLab have fabricated two superconducting cavities from the center of a large grain Nb billet. Both cavities had excellent properties with one reaching 185 mT and the other attaining a gradient of 45 MV/m.

Au Contacts Successfully Applied Across Bi-Crystal with flux penetration

Residual Resistance Ratios

Critical Currents at 4 Fields 4.2 K

Summary

1. MO Imaging shows flux penetration at perpendicular grain boundary in as-received slice with residual cold work on surface.
2. Flux penetration behavior is not topologically related.
3. Initial resistivity measurements indicate grain boundary weakness.